

11747.105002 NUS - Sequence Listing.ST25.txt
SEQUENCE LISTING

<110> National University of Singapore
Chua, Kaw Yan
Liew, Lip Nyin

<120> Recombinant Nucleic Acid Useful for Inducing Protective Immune Response Against Allergens

<130> 11747.105002 NUS002

<140> 10/526,120
<141> 2005-02-28

<150> PCT/SG03/00205
<151> 2003-08-29

<160> 52

<170> PatentIn version 3.3

<210> 1
<211> 216
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide encoding for the leader sequence, the transmembrane and cytoplasmic tail of Mus musculus LAMP-1, containing Nhe I site 3' of the LAMP-1 leader sequence and Nde I site 5' of the LAMP-1 transmembrane and cytop

<400> 1
ctcgagccac catggccgcc cccggcgccc ggaggcccct gtcctgctg ctgctggcag 60
gccttgcaaca tggcgctagc gaattcccgg ggatccatat gttgatcccc attgctgtgg 120
gCGgtgccct ggcagggctg gtcctcatcg tcctcatcgc ctacctcatt ggcaggaaga 180
ggagtcacgc cggctatcag accatctagc ggccgc 216

<210> 2
<211> 234
<212> DNA
<213> Artificial

<220>
<223> chimeric gene that encodes the Mus musculus LAMP-1 leader sequence, the B10 t5 gene fragment for the H-2d-restricted Th epitope and the Mus musculus LAMP-1 transmembrane and cytoplasmic domain

<400> 2
atggccgccc ccggcgcccc gagggcccctg ctccctgctgc tgctggcagg ccttgacat 60
ggcgctagcg cagaattgca agagaaaatc attcgagaac ttgatgttgt ttgcgccatg 120
aatatgttga tccccattgc tgtgggCGgt gccctggcag ggctggtcct catcgtcctc 180
attgcctacc tcattggcag gaagaggagt cacgccggct atcagaccat ctag 234

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<210> 3
 <211> 534
 <212> DNA
 <213> Artificial

<220>
 <223> chimeric gene that encodes the Mus musculus LAMP-1 leader sequence, the entire Blo t 5 gene product and the Mus musculus LAMP-1 transmembrane and cytoplasmic domain

<400> 3
 atggccgccc ccggcgcccc gagggcccctg ctcttgctgc tgctggcagg ctttgacat 60
 ggcgctagcc aagagcacia gccaaagaag gatgatttcc gaaacgaatt cgatcacttg 120
 ttgatcgaac aggcaaacca tgctatcgaa aaggggagaac atcaattgct ttacttgcaa 180
 caccaactcg acgaattgaa tgaaaacaag agcaaggaat tgcaagagaa aatcattcga 240
 gaacttgatg ttgtttgcgc catgatcgaa ggagcccaag gagctttgga acgtgaattg 300
 aagcgaactg atcttaacat tttggaacga ttcaactacg aagaggctca aactctcagc 360
 aagatcttgc ttaaggattt gaaggaaacc gaacaaaaag tgaaggatat tcaaacccaa 420
 aatatgttga tccccattgc tgtgggcggt gccctggcag ggctggtcct catcgtcctc 480
 atcgccctacc tcattggcag gaagaggagt cacgccggct atcagaccat ctag 534

<210> 4
 <211> 420
 <212> DNA
 <213> Artificial

<220>
 <223> chimeric gene that encodes the Mus musculus LAMP-1 leader sequence and the entire Blo t 5 gene product

<400> 4
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 ggcgctagcc aagagcacia gccaaagaag gatgatttcc gaaacgaatt cgatcacttg 120
 ttgatcgaac aggcaaacca tgctatcgaa aaggggagaac atcaattgct ttacttgcaa 180
 caccaactcg acgaattgaa tgaaaacaag agcaaggaat tgcaagagaa aatcattcga 240
 gaacttgatg ttgtttgcgc catgatcgaa ggagcccaag gagctttgga acgtgaattg 300
 aagcgaactg atcttaacat tttggaacga ttcaactacg aagaggctca aactctcagc 360
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<210> 5
 <211> 849
 <212> DNA
 <213> Artificial

<220>
 <223> chimeric gene that encodes the Mus musculus LAMP-1 leader sequence, the entire Der p 1 gene product and the Mus musculus

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LAMP-1 transmembrane and cytoplasmic domain

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<400> 5
atggccgccc ccggcgcccc gagggcccctg ctcttgctgc tgctggcagg ccttgccat      60
ggcgctagca ctaacgcctg cagtatcaat ggaaatgctc cagctgaaat cgatttgca      120
caaatgcgaa ctgtcactcc cattcgtatg caaggagggt gtggttcatg ttgggctttc      180
tctggtgttg ccgcaactga atcagcttat ttggcttacc gtaatcaatc attggatctt      240
gctgaacaag aattagtcga ttgtgcttcc caacacgggt gtcattggtga taccattcca      300
cgtgggtattg aatacatcca acataatggt gtcgtccaag aaagctacta tcgatacggt      360
gcacgagaac aatcatgccg acgaccaaat gcacaacggt tcggtatctc aaactattgc      420
caaatttacc caccaaattg aaacaaaatt cgtgaagctt tggctcaaac ccacagcgct      480
attgccgtca ttattggcat caaagattta gacgcattcc gtcattatga tggccgaaca      540
atcattcaac gcgataatgg ttaccaacca aactatcacg ctgtcaacat tgttggttac      600
agtaacgcac aagggtgctga ttattggatc gtacgaaaca gttgggatac caattggggt      660
gataatgggtt acggttattt tgctgccaac atcgatttga tgatgattga agaatatcca      720
tatgttgctc ttctcaatat gttgatcccc attgctgtgg gcggtgccct ggcagggctg      780
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accatctag                                         849
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<210> 6
<211> 879
<212> DNA
<213> Artificial
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<220>
<223> chimeric gene that encodes the Homo sapiens tissue plasminogen
activator leader sequence, the entire Der p 1 gene product and
the Mus musculus LAMP-1 transmembrane and cytoplasmic domain
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<400> 6
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atcaacggca atgcccccgcc tgagattgat ctgcgccaga tgaggaccgt gactcccatc      180
cgcatgcaag gcggctgcgg gtcttggttg gccttctcag gcgtggccgc gaccgagtct      240
gcatacctcg cgtatcgga tcagagcctg gacctcgctg agcaggagct cgttgactgc      300
gcctccaac acggatgtca tggggatacg attcccagag gtatcgaata catccagcat      360
aatggcgctc tgcaggaaag ctattaccga tacgtagcta gggagcagtc ctgccgccgt      420
cctaacgccc agcgcttcgg catttccaac tattgccaga tctaccccc taatgtgaac      480
aagatcaggg aggccctggc gcagacgcac agcgccatcg ctgtcatcat cggaatcaag      540
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gatctggacg cattccggca ctatgacggg cgcacaatca tccagcgcga caacggatac 600
cagccaaact atcacgcggt caacatcgtg gggtactcga acgcccaggg ggtggactac 660
tggatcgtgc ggaacagttg ggacaccaac tggggcgaca acggctacgg ctactttgcc 720
gccaacatcg acctgatgat gatcgaagag taccgcgtacg tggatgacct gttgatcccc 780
attgctgtgg gcggtgccct ggcagggctg gtcctcatcg tcctcattgc ctacctcatt 840
ggcaggaaga ggagtcacgc cggctatcag accatctag 879

<210> 7
<211> 26
<212> PRT
<213> Rattus norvegicus LIMP II Leader peptide
<400> 7

Met Ala Arg Cys Cys Phe Tyr Thr Ala Gly Thr Leu Ser Leu Leu Leu
1 5 10 15

Leu Val Thr Ser Val Thr Leu Leu Val Ala
20 25

<210> 8
<211> 46
<212> PRT
<213> Rattus norvegicus LIMP II Transmembrane cytoplasmic
domain

<400> 8

Leu Ile Val Thr Asn Ile Pro Tyr Ile Ile Met Ala Leu Gly Val Phe
1 5 10 15

Phe Gly Leu Ile Phe Thr Trp Leu Ala Cys Arg Gly Gln Gly Ser Thr
20 25 30

Asp Glu Gly Thr Ala Asp Glu Arg Ala Pro Leu Ile Arg Thr
35 40 45

<210> 9
<211> 26
<212> PRT
<213> Homo sapiens LIMP II Leader peptide

<400> 9

Met Gly Arg Cys Cys Phe Tyr Thr Ala Gly Thr Leu Ser Leu Leu Leu
1 5 10 15

Leu Val Thr Ser Val Thr Leu Leu Val Ala
20 25

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<210> 10

<211> 46

<212> PRT

<213> Homo sapiens LIMP II Transmembrane cytoplasmic domain

<400> 10

Leu Ile Ile Thr Asn Ile Pro Tyr Ile Ile Met Ala Leu Gly Val Phe
1 5 10 15

Phe Gly Leu Val Phe Thr Trp Leu Ala Cys Lys Gly Gln Gly Ser Met
20 25 30

Asp Glu Gly Thr Ala Asp Glu Arg Ala Pro Leu Ile Arg Thr
35 40 45

<210> 11

<211> 26

<212> PRT

<213> Mus musculus LIMP II Leader peptide

<400> 11

Met Gly Arg Cys Cys Phe Tyr Thr Ala Gly Thr Leu Ser Leu Leu Leu
1 5 10 15

Leu Val Thr Ser Val Thr Leu Leu Val Ala
20 25

<210> 12

<211> 46

<212> PRT

<213> Mus musculus LIMP II Transmembrane cytoplasmic domain

<400> 12

Leu Val Val Thr Asn Ile Pro Tyr Ile Ile Met Ala Leu Gly Val Phe
1 5 10 15

Phe Gly Leu Val Phe Thr Trp Leu Ala Cys Arg Gly Gln Gly Ser Met
20 25 30

Asp Glu Gly Thr Ala Asp Glu Arg Ala Pro Leu Ile Arg Thr
35 40 45

<210> 13

<211> 27

<212> PRT

<213> Homo sapiens DEC-205 Leader peptide

<400> 13

Met Arg Thr Gly Trp Ala Thr Pro Arg Arg Pro Ala Gly Leu Leu Met
1 5 10 15

Leu Leu Phe Trp Phe Phe Asp Leu Ala Glu Pro
20 25

<210> 14

<211> 56

<212> PRT

<213> Homo sapiens DEC-205 Transmembrane cytoplasmic domain

<400> 14

Tyr Thr Ala Ile Ala Ile Ile Val Ala Thr Leu Ser Ile Leu Val Leu
1 5 10 15

Met Gly Gly Leu Ile Trp Phe Leu Phe Gln Arg His Arg Leu His Leu
20 25 30

Ala Gly Phe Ser Ser Val Arg Tyr Ala Gln Gly Val Asn Glu Asp Glu
35 40 45

Ile Met Leu Pro Ser Phe His Asp
50 55

<210> 15

<211> 27

<212> PRT

<213> Mus musculus DEC-205 Leader peptide

<400> 15

Met Arg Thr Gly Arg Val Thr Pro Gly Leu Ala Ala Gly Leu Leu Leu
1 5 10 15

Leu Leu Leu Arg Ser Phe Gly Leu Val Glu Pro
20 25

<210> 16

<211> 56

<212> PRT

<213> Mus musculus DEC-205 Transmembrane cytoplasmic domain

<400> 16

Tyr Thr Gly Ile Ala Ile Leu Phe Ala Val Leu Cys Leu Leu Gly Leu
1 5 10 15

Ile Ser Leu Ala Ile Trp Phe Leu Leu Gln Arg Ser His Ile Arg Trp
20 25 30

Thr Gly Phe Ser Ser Val Arg Tyr Glu His Gly Thr Asn Glu Asp Glu
35 40 45

Val Met Leu Pro Ser Phe His Asp

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<210> 17
<211> 41
<212> PRT
<213> Homo sapiens P-selectin Leader peptide

<400> 17

Met Ala Asn Cys Gln Ile Ala Ile Leu Tyr Gln Arg Phe Gln Arg Val
1 5 10 15

Val Phe Gly Ile Ser Gln Leu Leu Cys Phe Ser Ala Leu Ile Ser Glu
20 25 30

Leu Thr Asn Gln Lys Glu Val Ala Ala
35 40

<210> 18
<211> 59
<212> PRT
<213> Homo sapiens P-selectin Transmembrane cytoplasmic domain

<400> 18

Leu Thr Tyr Phe Gly Gly Ala Val Ala Ser Thr Ile Gly Leu Ile Met
1 5 10 15

Gly Gly Thr Leu Leu Ala Leu Leu Arg Lys Arg Phe Arg Gln Lys Asp
20 25 30

Asp Gly Lys Cys Pro Leu Asn Pro His Ser His Leu Gly Thr Tyr Gly
35 40 45

Val Phe Thr Asn Ala Ala Phe Asp Pro Ser Pro
50 55

<210> 19
<211> 17
<212> PRT
<213> Homo sapiens tyrosinase Leader peptide

<400> 19

Met Leu Leu Ala Val Leu Tyr Cys Leu Leu Trp Ser Phe Gln Thr Ser
1 5 10 15

Ala

<210> 20
<211> 30
<212> PRT

<213> Homo sapiens tyrosinase Transmembrane cytoplasmic domain

<400> 20

Cys Arg His Lys Arg Lys Gln Leu Pro Glu Glu Lys Gln Pro Leu Leu
1 5 10 15

Met Glu Lys Glu Asp Tyr His Ser Leu Tyr Gln Ser His Leu
20 25 30

<210> 21

<211> 24

<212> PRT

<213> Homo sapiens GLUT4 Leader peptide

<400> 21

Met Pro Ser Gly Phe Gln Gln Ile Gly Ser Glu Asp Gly Glu Pro Pro
1 5 10 15

Gln Gln Arg Val Thr Gly Thr Leu
20

<210> 22

<211> 43

<212> PRT

<213> Homo sapiens GLUT4 Transmembrane Cytoplasmic domain

<400> 22

Arg Val Pro Glu Thr Arg Gly Arg Thr Phe Asp Gln Ile Ser Ala Ala
1 5 10 15

Phe His Arg Thr Pro Ser Leu Leu Glu Gln Glu Val Lys Pro Ser Thr
20 25 30

Glu Leu Glu Tyr Leu Gly Pro Asp Glu Asn Asp
35 40

<210> 23

<211> 21

<212> PRT

<213> Rattus norvegicus endotubin Leader peptide

<400> 23

Met Cys Leu Pro Ser Cys Leu Leu Ser Ile Trp Val Leu Phe Met Ala
1 5 10 15

Ala Gln Ser Leu Gly
20

<210> 24

<211> 66

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<212> PRT

<213> Rattus norvegicus endotubin Transmembrane Cytoplasmic domain

<400> 24

Ala Ala Pro Val Ser Val Pro Val Ala Val Gly Gly Ala Leu Leu Leu
1 5 10 15

Phe Leu Leu Leu Leu Gly Leu Gly Gly Trp His Trp Leu Gln Lys Gln
20 25 30

His Leu Pro Cys Gln Ser Thr Asp Ala Ala Ala Ser Gly Phe Asp Asn
35 40 45

Ile Leu Phe Asn Ala Asp Gln Val Thr Leu Pro Glu Ser Ile Thr Ser
50 55 60

Asn Pro
65

<210> 25

<211> 23

<212> PRT

<213> Mus musculus LAMP-1 leader peptide

<400> 25

Met Ala Ala Pro Gly Ala Arg Arg Pro Leu Leu Leu Leu Leu Leu Ala
1 5 10 15

Gly Leu Ala His Gly Ala Ser
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<210> 26

<211> 36

<212> PRT

<213> Mus musculus LAMP-1 transmembrane and cytoplasmic domain

<400> 26

Met Leu Ile Pro Ile Ala Val Gly Gly Ala Leu Ala Gly Leu Val Leu
1 5 10 15

Ile Val Leu Ile Ala Tyr Leu Ile Gly Arg Lys Arg Ser His Ala Gly
20 25 30

Tyr Glu Thr Ile
35

<210> 27

<211> 78

<212> DNA

<213> Rattus norvegicus nucleotide sequence encoding the LIMP II leader peptide

<400> 27
atggcccgat gctgcttcta cacggcgggg acactgtctc tgctgctgct ggtgaccagt 60
gtcacgctgc tagtggct 78

<210> 28

<211> 141

<212> DNA

<213> Rattus norvegicus nucleotide sequence encoding the LIMP II Transmembrane cytoplasmic domain

<400> 28
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ttcacgtggc tggcgtgtcg aggacagggg tctacggatg agggaactgc agatgaaagg 120
gcacccctca tacggaccta a 141

<210> 29

<211> 78

<212> DNA

<213> Homo sapiens nucleotide sequence encoding the LIMP II Leader peptide

<400> 29
atgggcccgat gctgcttcta cacggcgggg acgttgtccc tgctcctgct ggtgaccagc 60
gtcacgctgc tggtaggcc 78

<210> 30

<211> 141

<212> DNA

<213> Homo sapiens nucleotide sequence encoding the LIMP II Transmembrane cytoplasmic domain

<400> 30
ttgatcatca ccaacatacc ctacatcatc atggcgctgg gtgtgttctt tggtttggtt 60
tttacctggc ttgcatgcaa aggacagggg tccatggatg agggaacagc ggatgaaaga 120
gcacccctca ttcgaaccta a 141

<210> 31

<211> 78

<212> DNA

<213> Mus musculus nucleotide sequence encoding the LIMP II Leader peptide

<400> 31
atgggcagat gctgcttcta cacggcgggg acgctgtctc tgctgctgct ggtgaccagc 60
gtcacgctgc tagtggct 78

<210> 32

<211> 141

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<212> DNA
<213> Mus musculus nucleotide sequence encoding the LIMP II
        Transmembrane cytoplasmic domain

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ttcacgtggc tggcgtgtcg aggacagggg tctatggatg agggaaactgc agatgaaaga      120
gcacccctca tacgaaccta a                                                  141

<210> 33
<211> 81
<212> DNA
<213> Homo sapiens nucleotide sequence encoding the DEC-205 Leader
        peptide

<400> 33
atgaggacag gctgggacgac ccctcgccgc ccggcggggc tcctcatgct gctcttctgg      60
ttcttcgatc tcgcgagacc c                                                  81

<210> 34
<211> 171
<212> DNA
<213> Homo sapiens nucleotide sequence encoding the DEC-205
        Transmembrane cytoplasmic domain

<400> 34
tacacagcaa tagctatcat agttgccaca ctaagtatct tagttctcat gggcggactg      60
atttggttcc tcttccaaag gcaccgtttg cacctggcgg gtttctcatc agttcgatat      120
gcacaaggag tgaatgaaga tgagattatg cttccttctt tccatgacta a              171

<210> 35
<211> 81
<212> DNA
<213> Mus musculus nucleotide sequence encoding the DEC-205 leader
        peptide

<400> 35
atgcggacgg gccgggtgac cccgggcctg gcggcggggc tactcctgct gttgctgcgg      60
tccttcgggc ttgtggagcc t                                                  81

<210> 36
<211> 171
<212> DNA
<213> Mouse nucleotide sequence encoding the DEC-205 Transmembrane
        cytoplasmic domain

<400> 36
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atttggttcc tcttgcaacg atcccatatc cgctggaccg gcttctcctc gggttcggtat      120
gaacatggaa ccaacgaaga cgaggtgatg ctcccttctt tccacgacta a              171

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<210> 37
 <211> 123
 <212> DNA
 <213> Homo sapiens nucleotide sequence encoding the P-selectin Leader peptide

<400> 37
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 tcccaactcc ttgtgcttcag tgccctgagc tctgaactaa caaaccagaa agaagtggca 120
 gca 123

<210> 38
 <211> 180
 <212> DNA
 <213> Homo sapiens nucleotide sequence encoding the P-selectin Transmembrane cytoplasmic domain

<400> 38
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 ctggctttgc taagaaagcg ttccagacaa aaagatgatg ggaaatgccc cttgaatcct 120
 cacagccacc taggaacata tggagttttt acaaacgctg catttgaccc gagtccttaa 180

<210> 39
 <211> 51
 <212> DNA
 <213> Homo sapiens nucleotide sequence encoding the tyrosinase Leader peptide

<400> 39
 atgctcctgg ctgttttgta ctgcctgctg tggagtttcc agacctccgc t 51

<210> 40
 <211> 93
 <212> DNA
 <213> Homo sapiens nucleotide sequence encoding the tyrosinase Transmembrane cytoplasmic domain

<400> 40
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 gattaccaca gcttgatatca gagccattta taa 93

<210> 41
 <211> 72
 <212> DNA
 <213> Homo sapiens nucleotide sequence encoding the GLUT4 Leader peptide

<400> 41
 atgccgtcgg gcttccaaca gataggctcc gaagatgggg aacccccctca gcagcgagtg 60
 actgggaccc tg 72

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<210> 42
 <211> 129
 <212> DNA
 <213> Homo sapiens nucleotide sequence encoding the GLUT4 Transmembrane
 Cytoplasmic domain

<400> 42
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 tctcttttag agcaggaggt gaaacccagc acagaacttg agtatttagg gccagatgag 120
 aacgactga 129

<210> 43
 <211> 63
 <212> DNA
 <213> Rattus norvegicus nucleotide sequence encoding the endotubin
 Leader peptide

<400> 43
 atgtgcctgc ctagctgcct cctctcaatc tgggtcctat ttatggctgc acagtctcta 60
 ggc 63

<210> 44
 <211> 201
 <212> DNA
 <213> Rattus norvegicus nucleotide sequence encoding the endotubin
 Transmembrane cytoplasmic domain

<400> 44
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 ctgggccttg gaggttggca ctggctgcag aagcagcacc tcccctgcca aagtacagat 120
 gcagcagcct ctggctttga caatatcctc ttcaatgcgg atcaagttac cctcccagaa 180
 tcaatcacca gtaaccata g 201

<210> 45
 <211> 69
 <212> DNA
 <213> Mus musculus nucleotide sequence encoding the LAMP-1 leader
 sequence

<400> 45
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 ggcgctagc 69

<210> 46
 <211> 108
 <212> DNA
 <213> Mus musculus nucleotide sequence encoding the LAMP-1
 transmembrane cytoplasmic domain

<400> 46
 atgttgatcc ccattgctgt gggcggtgcc ctggcagggc tggctcctcat cgtcctcatc 60

gcctacctca ttggcaggaa gaggagtcac gccggctatc agaccatc 108

<210> 47
 <211> 105
 <212> DNA
 <213> Homo sapiens nucleotide sequence encoding the tissue plasminogen activator leader sequence

<400> 47
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 tcgcccagcc aggttggtgt gcaggacccc tgtgtcccgcc ccctc 105

<210> 48
 <211> 35
 <212> PRT
 <213> Homo sapiens tissue plasminogen activator leader peptide

<400> 48
 Met Asp Ala Met Lys Arg Gly Leu Cys Cys Val Leu Leu Leu Cys Gly
 1 5 10 15

Ala Val Phe Val Ser Pro Ser Gln Val Gly Val Gln Asp Pro Cys Val
 20 25 30

Pro Pro Leu
 35

<210> 49
 <211> 17
 <212> PRT
 <213> Artificial sequence

<220>
 <223> Blo t 5 H-2d-restricted T cell epitope peptide
 <400> 49

Ala Glu Leu Gln Glu Lys Ile Ile Arg Glu Leu Asp Val Val Cys Ala
 1 5 10 15

Met

<210> 50
 <211> 117
 <212> PRT
 <213> Artificial sequence

<220>
 <223> Blo t 5 peptide

<400> 50

Gln Glu His Lys Pro Lys Lys Asp Asp Phe Arg Asn Glu Phe Asp His
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1 5 10 15
 Leu Leu Ile Glu Gln Ala Asn His Ala Ile Glu Lys Gly Glu His Gln
 20 25 30
 Leu Leu Tyr Leu Gln His Gln Leu Asp Glu Leu Asn Glu Asn Lys Ser
 35 40 45
 Lys Glu Leu Gln Glu Lys Ile Ile Arg Glu Leu Asp Val Val Cys Ala
 50 55 60
 Met Ile Glu Gly Ala Gln Gly Ala Leu Glu Arg Glu Leu Lys Arg Thr
 65 70 75 80
 Asp Leu Asn Ile Leu Glu Arg Phe Asn Tyr Glu Glu Ala Gln Thr Leu
 85 90 95
 Ser Lys Ile Leu Leu Lys Asp Leu Lys Glu Thr Glu Gln Lys Val Lys
 100 105 110
 Asp Ile Gln Thr Gln
 115

<210> 51
 <211> 222
 <212> PRT
 <213> Artificial sequence

<220>
 <223> Der p 1 peptide

<400> 51

Thr Asn Ala Cys Ser Ile Asn Gly Asn Ala Pro Ala Glu Ala Asp Leu
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 Arg Gln Met Arg Thr Val Thr Pro Ile Arg Met Gln Gly Gly Cys Gly
 20 25 30
 Ser Cys Trp Ala Phe Ser Gly Val Ala Ala Thr Glu Ser Ala Tyr Leu
 35 40 45
 Ala Tyr Arg Asn Gln Ser Leu Asp Leu Ala Glu Gln Glu Leu Val Asp
 50 55 60
 Cys Ala Ser Gln His Gly Cys His Gly Asp Thr Ile Pro Arg Gly Ile
 65 70 75 80
 Glu Tyr Ile Gln His Asn Gly Val Val Gln Glu Ser Tyr Tyr Arg Tyr
 85 90 95

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Val Ala Arg Glu Gln Ser Cys Arg Arg Pro Asn Ala Gln Arg Phe Gly
100 105 110

Ile Ser Asn Tyr Cys Gln Ile Tyr Pro Pro Asn Val Asn Lys Ile Arg
115 120 125

Glu Ala Leu Ala Gln Thr His Ser Ala Ile Ala Val Ile Ile Gly Ile
130 135 140

Lys Asp Leu Asp Ala Phe Arg His Tyr Asp Gly Arg Thr Ile Ile Gln
145 150 155 160

Arg Asp Asn Gly Tyr Gln Pro Asn Tyr His Ala Val Asn Ile Val Gly
165 170 175

Tyr Ser Asn Ala Gln Gly Val Asp Tyr Trp Ile Val Arg Asn Ser Trp
180 185 190

Asp Thr Asn Trp Gly Asp Asn Gly Tyr Gly Tyr Phe Ala Ala Asn Ile
195 200 205

Asp Leu Met Met Ile Glu Glu Tyr Pro Tyr Val Val Ile Leu
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<210> 52

<211> 37

<212> PRT

<213> Mus musculus LAMP-1 transmembrane & cytoplasmic domain

<400> 52

Asn Met Leu Ile Pro Ile Ala Val Gly Gly Ala Leu Ala Gly Leu Val
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Leu Ile Val Leu Ile Ala Tyr Leu Ile Gly Arg Lys Arg Ser His Ala
20 25 30

Gly Tyr Glu Thr Ile
35